Objective
Video Quality
Measurement

NTIA Institute for Telecommunication Sciences

Highlights

- **Unique Perception-Based Measurements**

- **Measurements are ANSI Standard**

- **Measurement Technology is Patented**

- **Technology Can be Used for In-Service Video Quality Measurement**

- **Measurements Have High Correlation with Subjective Test Results**

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Real-Time Video Quality Measurement System
ITS Video Quality Laboratory

Digital Video Impairments

Digital compression and transmission techniques offer an economical means of implementing video communication services in emerging national and global information infrastructures. However, the quality of digital video systems cannot be evaluated using the static test patterns and waveform reproduction measures traditionally used in assessing analog video systems. New digital video systems introduce fundamentally different impairments than those created by analog reproduction methods. Examples of compression-related impairments in digital video communications are edge busyness, error blocks, localized smearing, jerkiness (i.e., jerky motion), and blocking/tiling. For digital video systems the spatial and temporal information content of the source plays a crucial role in determining the amount of compression that is possible and the severity of the compression artifacts. The user-perceived quality is a dynamic function of both the transmission system and the input signal.

The ITS Measurement Solution

ITS engineers are addressing the digital video quality measurement problem through the development and standardization of a fundamentally new methodology for video quality assessment. The ITS-developed methodology employs natural video scenes (rather than artificial test patterns) as input material, and captures the observable effects of a wide range of impairments using perception based video quality parameters that have been selected for their correlation with the subjective assessments of human viewer panels. Many of the ITS-developed parameters are specified in ANSI T1.801.03-1996 ("American National Standard for Telecommunications - Digital Transport of One-Way Video Signals - Parameters for Objective Performance Assessment"), published in February, 1996. These parameters can be used to characterize both spatial and temporal distortions in the output video. They have been extensively tested on a wide range of video systems and bit rates including video teleconferencing, MPEG, DS3 (45 Mb/sec), as well as analog video systems.